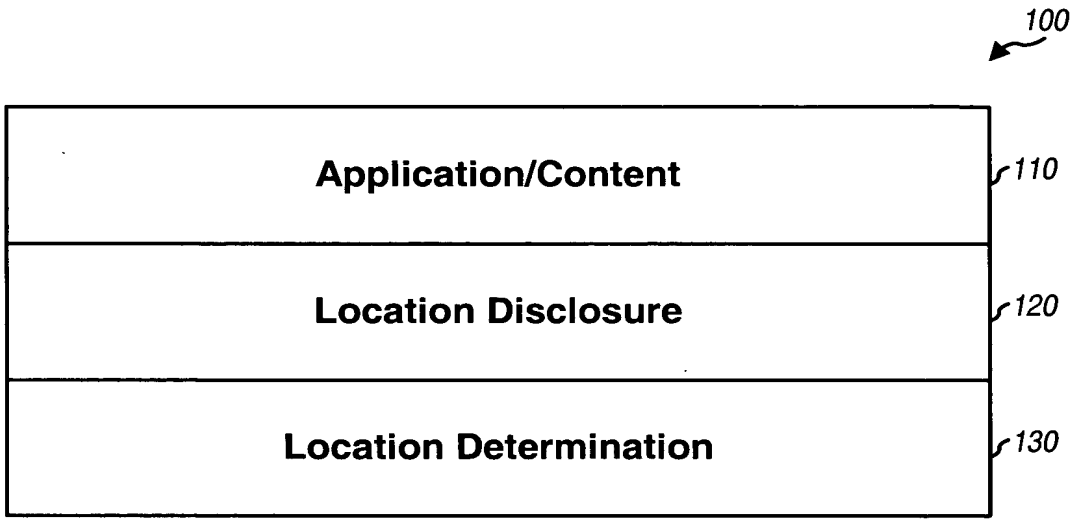
100
Application/Content
110
Location Disclosure
120
Location Determination
130

FIG. 1A

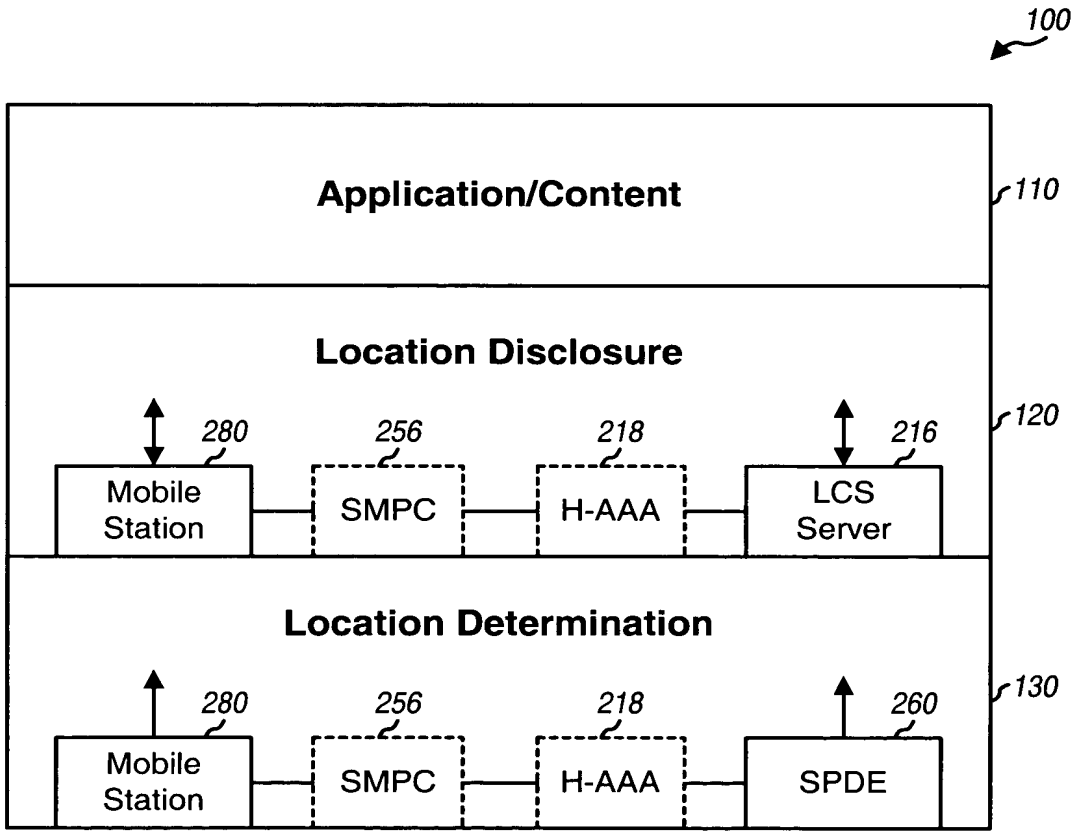
100
Application/Content
110
Location Disclosure
280
256
218
216
Mobile Station
SMPC
H-AAA
LCS Server
120
Location Determination
280
256
218
260
Mobile Station
SMPC
H-AAA
SPDE
130

FIG. 1B

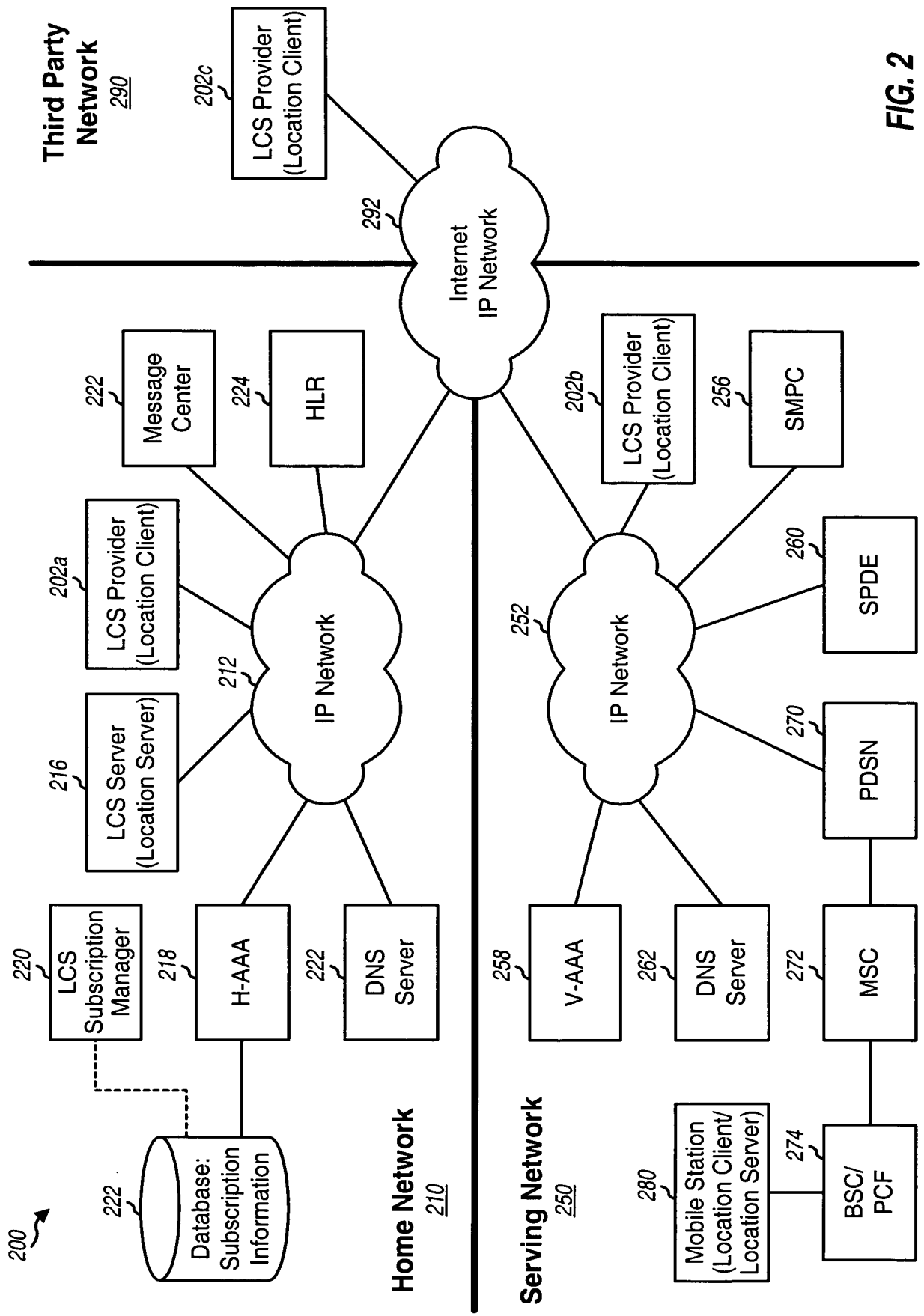
200
Third Party Network
290
202c
LCS Provider (Location Client)
292
Internet IP Network
222
Message Center
224
HLR
202a
LCS Provider (Location Client)
212
IP Network
216
LCS Server (Location Server)
220
LCS Subscription Manager
218
H-AAA
222
DNS Server
222
Database: Subscription Information
Home Network
210
202b
LCS Provider (Location Client)
256
SMPC
252
IP Network
260
SPDE
270
PDSN
258
V-AAA
262
DNS Server
272
MSC
280
Mobile Station (Location Client/ Location Server)
274
BSC/ PCF
Serving Network
250

FIG. 2

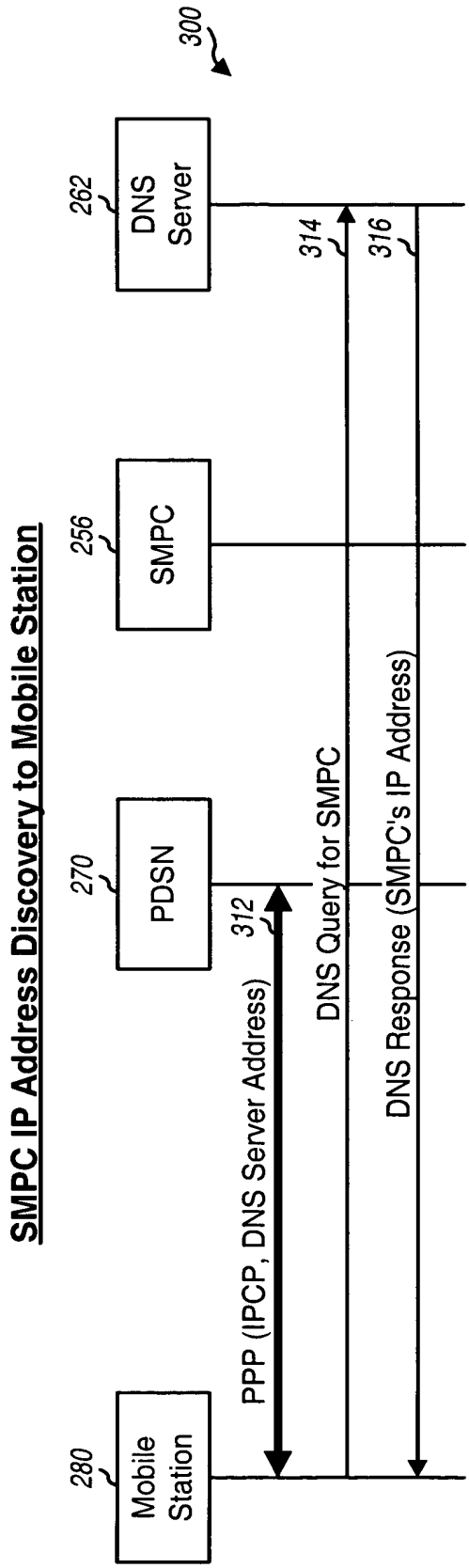
SMPC IP Address Discovery to Mobile Station
300
262
DNS Server
256
SMPC
270
PDSN
280
Mobile Station
312
PPP (IPCP, DNS Server Address)
314
DNS Query for SMPC
316
DNS Response (SMPC's IP Address)

FIG. 3A

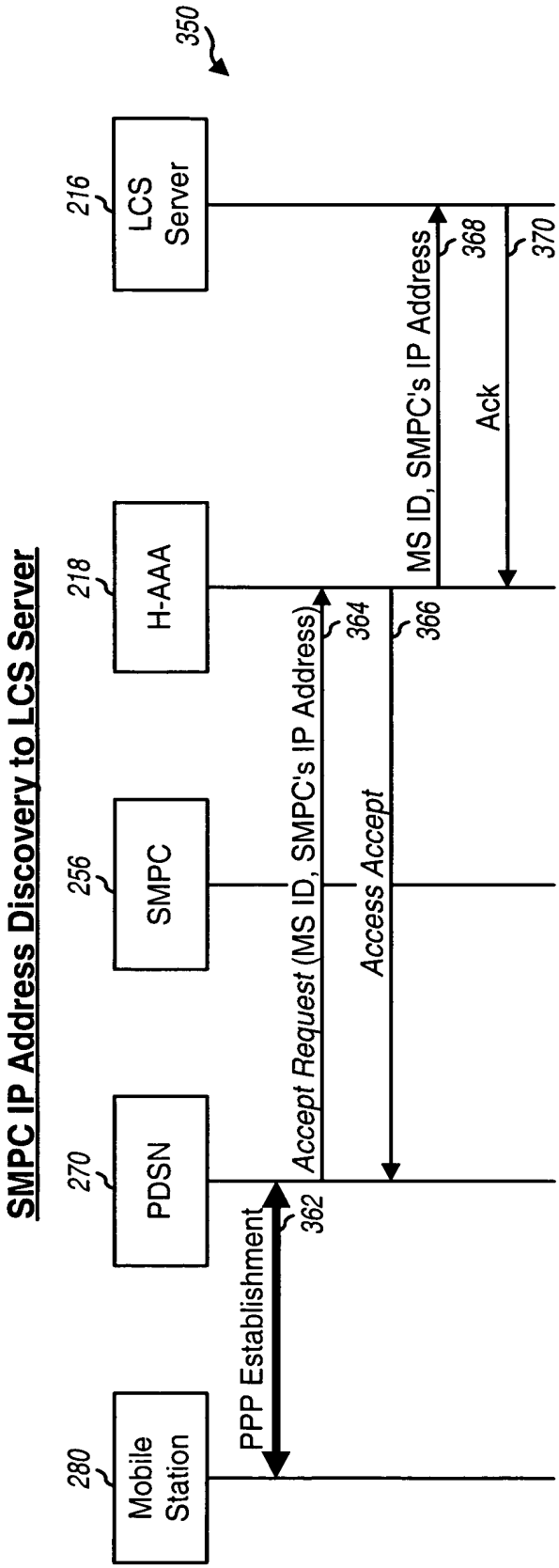
SMPC IP Address Discovery to LCS Server
350
216
LCS Server
218
H-AAA
256
SMPC
270
PDSN
280
Mobile Station
362
PPP Establishment
364
Accept Request (MS ID, SMPC's IP Address)
366
Access Accept
368
MS ID, SMPC's IP Address
370
Ack

FIG. 3B

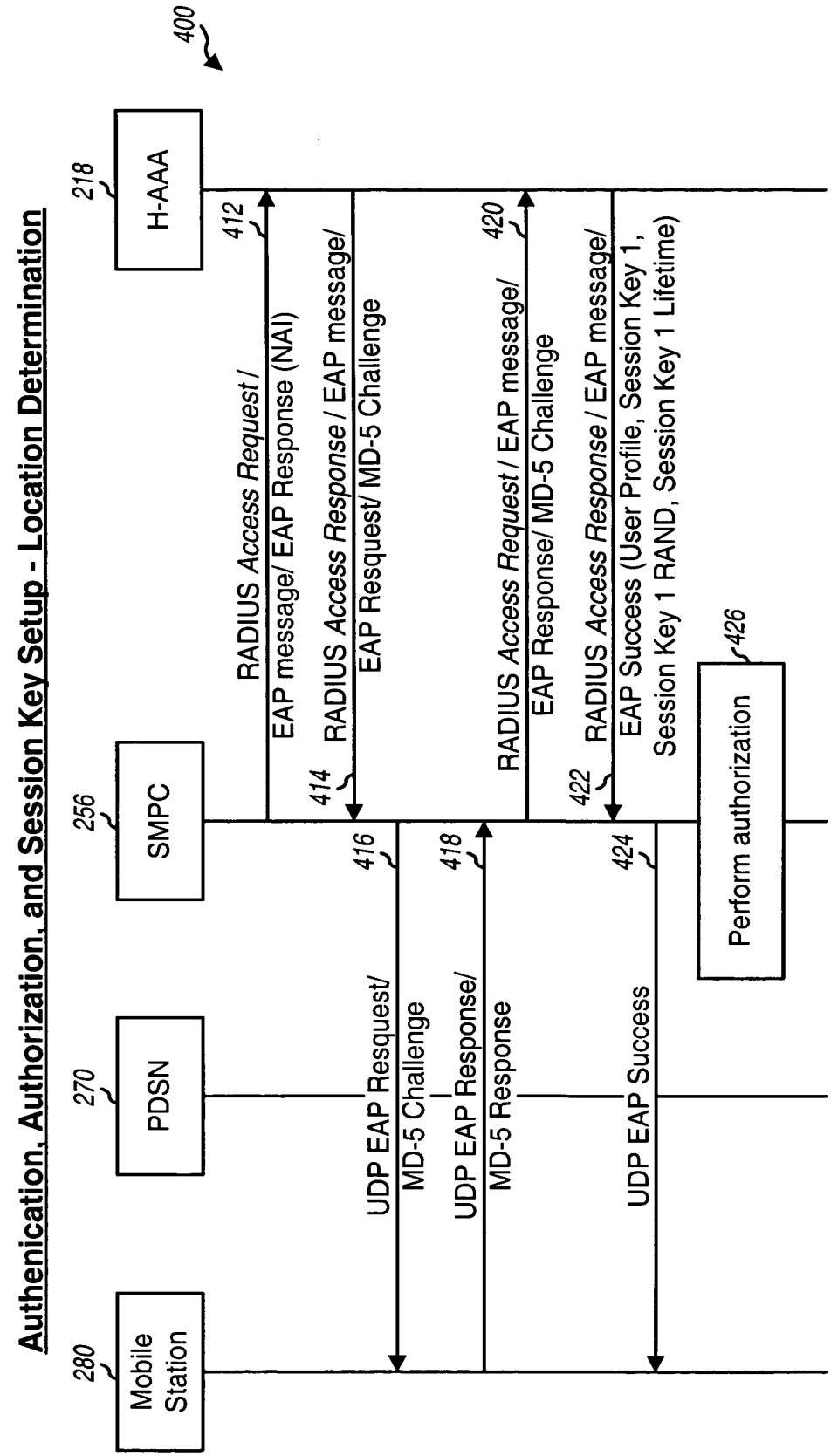
Authenication, Authorization, and Session Key Setup - Location Determination
400
Mobile Station
280
PDSN
270
SMPC
256
H-AAA
218
412
RADIUS Access Request / EAP message/ EAP Response (NAI)
414
RADIUS Access Response / EAP message/ EAP Resquest/ MD-5 Challenge
416
UDP EAP Resquest/ MD-5 Challenge
418
UDP EAP Response/ MD-5 Response
420
RADIUS Access Request / EAP message/ EAP Response/ MD-5 Challenge
422
RADIUS Access Response / EAP message/ EAP Success (User Profile, Session Key 1, Session Key 1 RAND, Session Key 1 Lifetime)
424
UDP EAP Success
426
Perform authorization

FIG. 4A

Authenication, Authorization, and Session Key Setup - Location Disclosure

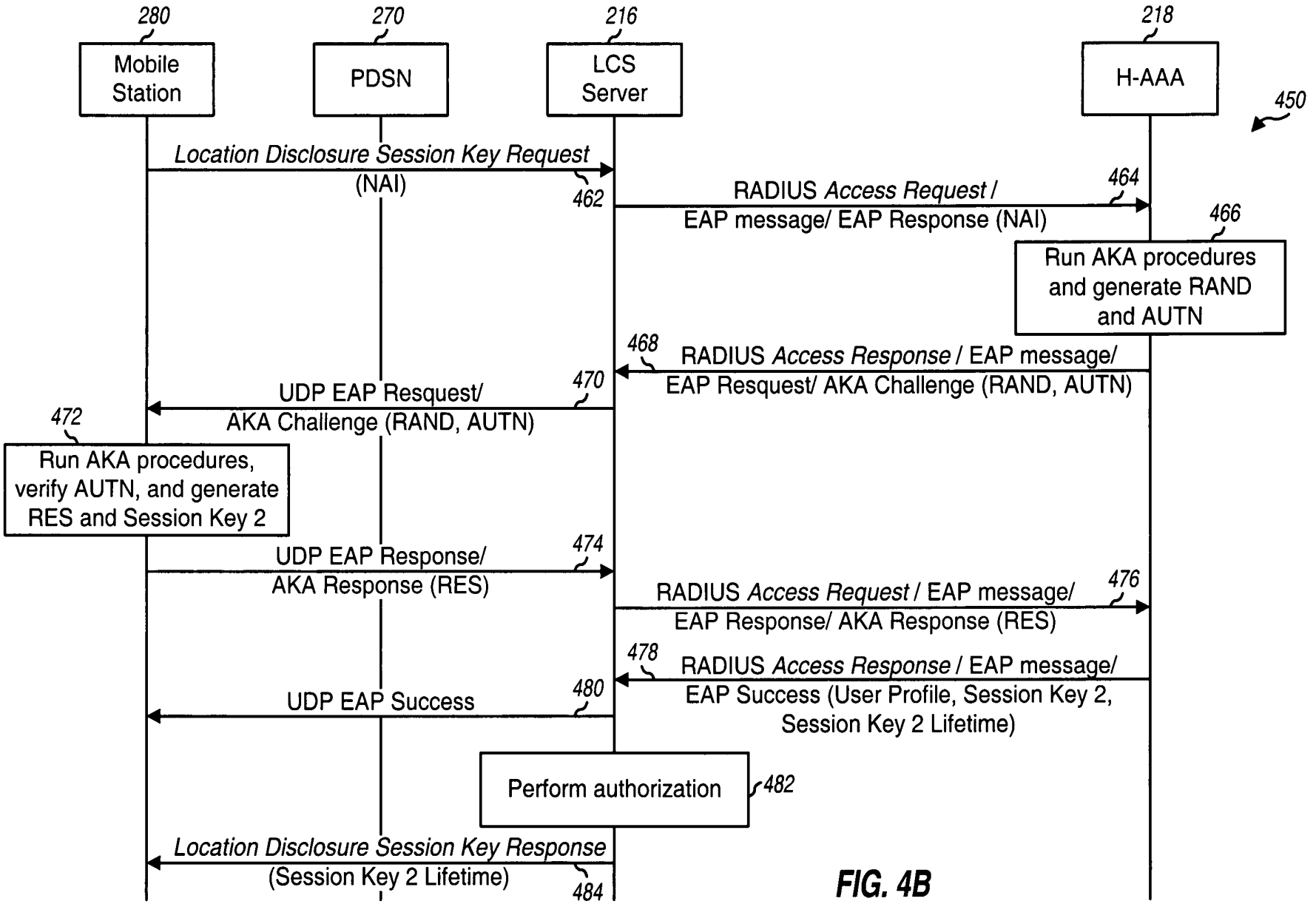

FIG. 4B

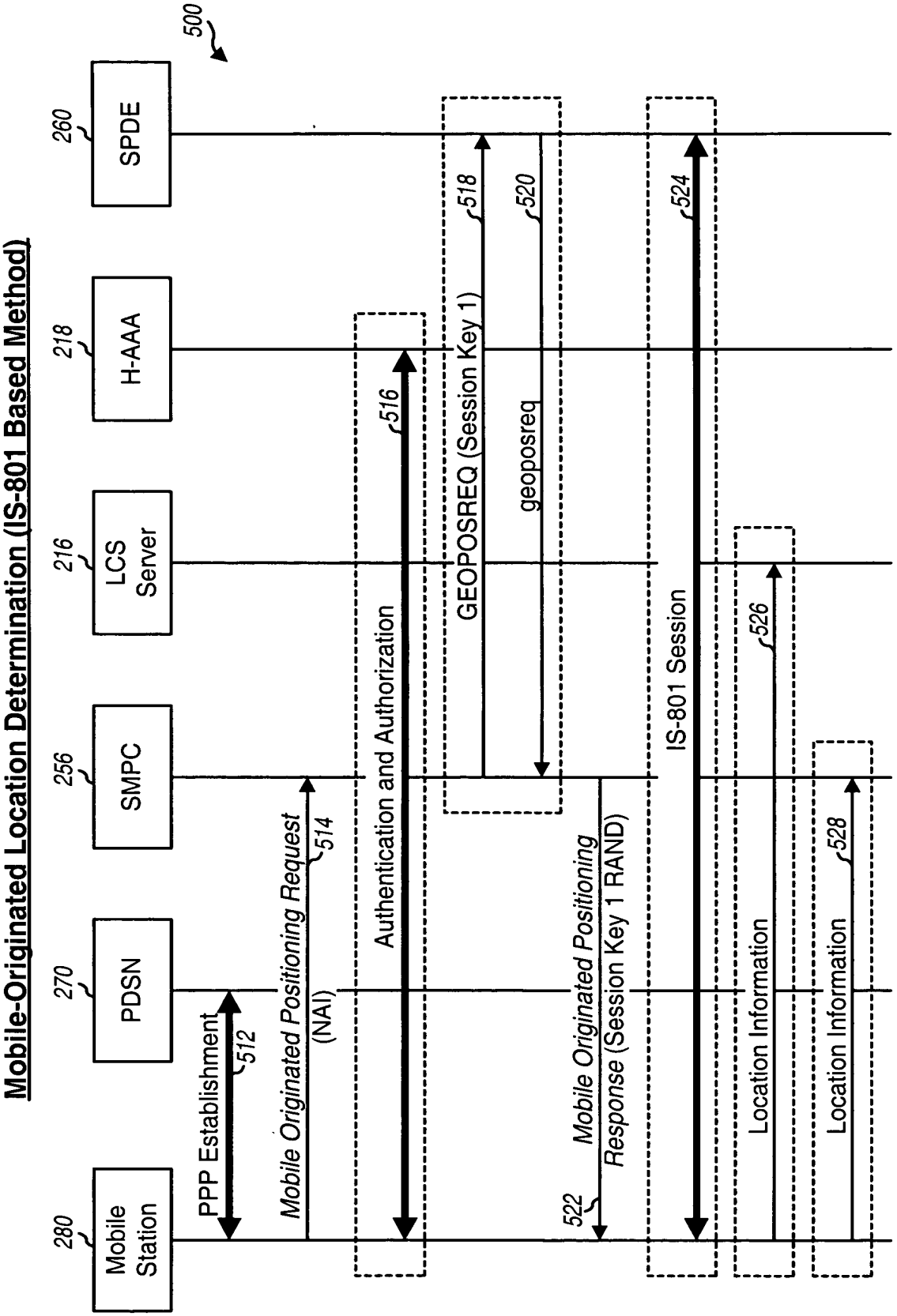
Mobile-Originated Location Determination (IS-801 Based Method)
500
280
Mobile Station
270
PDSN
256
SMPC
216
LCS Server
218
H-AAA
260
SPDE
PPP Establishment
512
Mobile Originated Positioning Request
(NAI)
514
Authentication and Authorization
516
GEOPOSREQ (Session Key 1)
518
geoposreq
520
IS-801 Session
524
Location Information
526
Location Information
528
Mobile Originated Positioning
Response (Session Key 1 RAND)
522

FIG. 5A

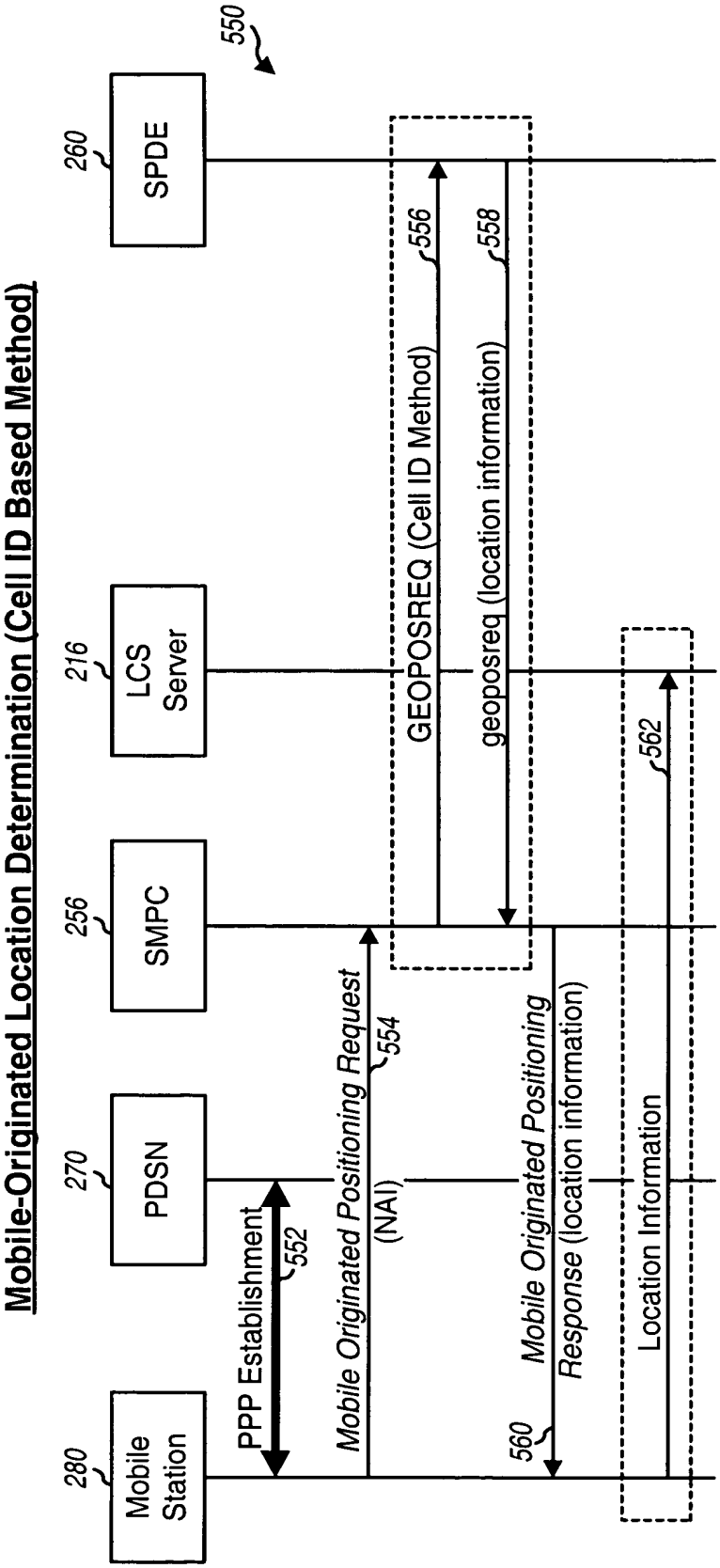
Mobile-Originated Location Determination (Cell ID Based Method)
550
280
Mobile Station
270
PDSN
256
SMPC
216
LCS Server
260
SPDE
PPP Establishment
552
Mobile Originated Positioning Request
(NAI)
554
GEOPOSREQ (Cell ID Method)
556
geoposreq (location information)
558
Mobile Originated Positioning Response (location information)
560
Location Information
562

FIG. 5B

Mobile-Originated Location Disclosure -
Location Server Located in Mobile Station & Location Information Cached in SMPC)

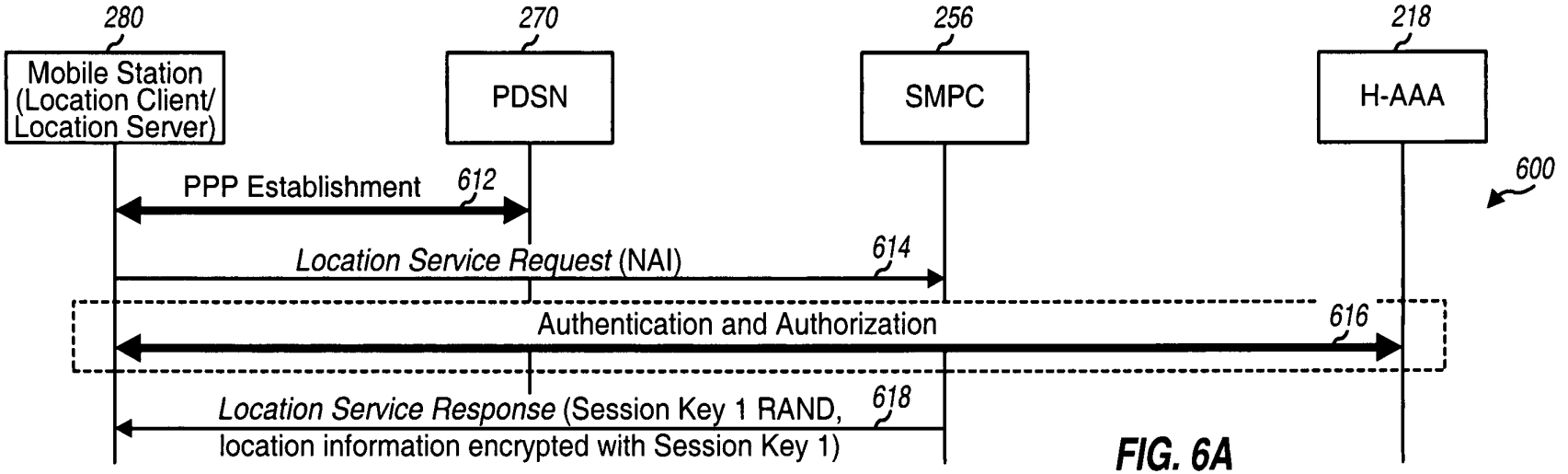

FIG. 6A

Mobile-Originated Location Disclosure -
Location Server Located in Home Network & Location Information Cached in LCS Server)

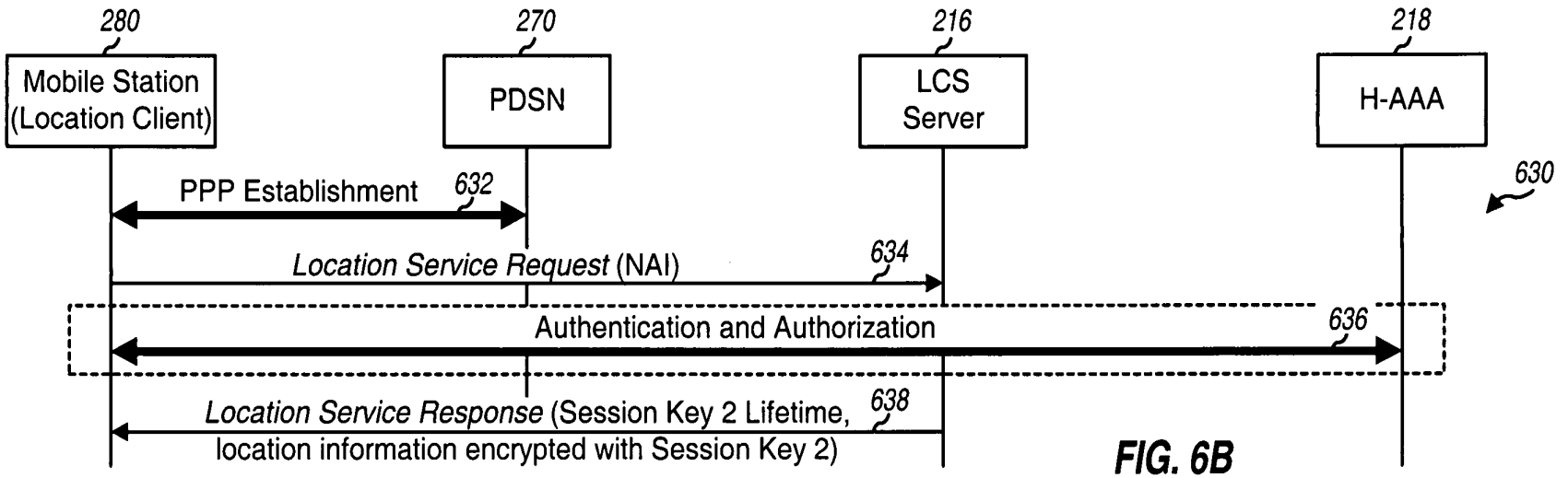

FIG. 6B

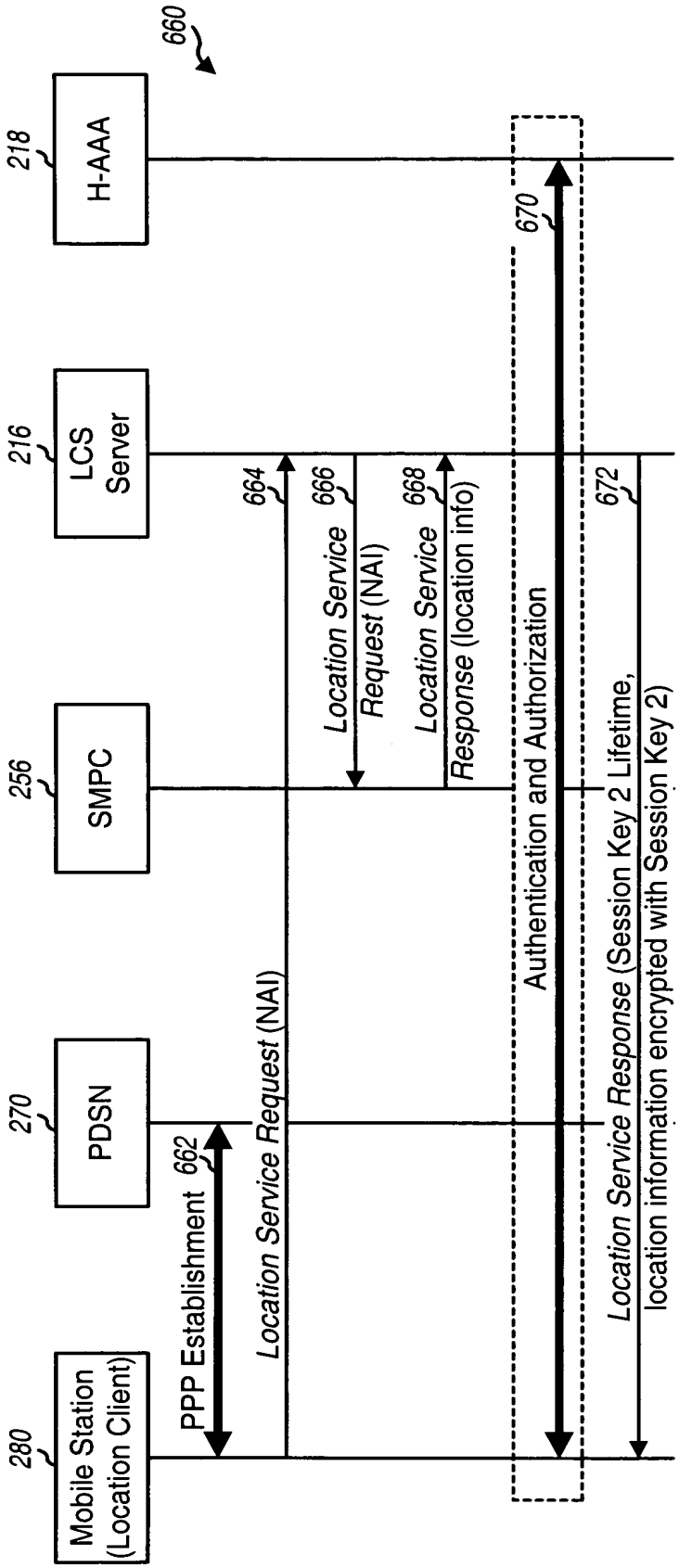
Mobile-Originated Location Disclosure -
Location Server Located in Home Network & Location Information Cached in SMPC)
660
280
Mobile Station (Location Client)
270
PDSN
256
SMPC
216
LCS Server
218
H-AAA
PPP Establishment
662
Location Service Request (NAI)
664
Location Service Request (NAI)
666
Location Service Response (location info)
668
Authentication and Authorization
670
Location Service Response (Session Key 2 Lifetime, location information encrypted with Session Key 2)
672

FIG. 6C

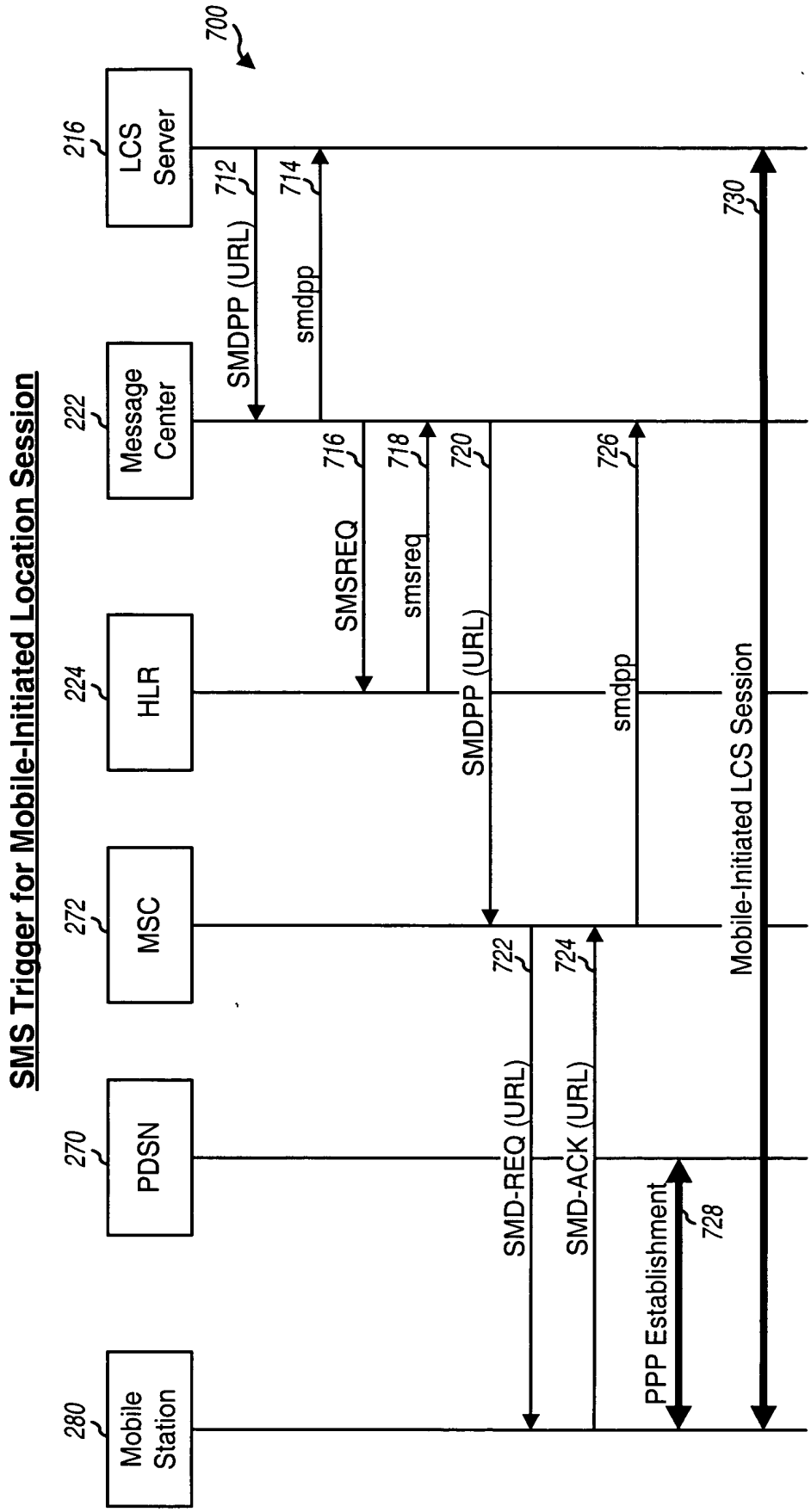
SMS Trigger for Mobile-Initiated Location Session
700
216
LCS Server
222
Message Center
224
HLR
272
MSC
270
PDSN
280
Mobile Station
712
SMDPP (URL)
714
smdpp
716
SMSREQ
718
smsreq
720
SMDPP (URL)
726
smdpp
730
Mobile-Initiated LCS Session
722
SMD-REQ (URL)
724
SMD-ACK (URL)
728
PPP Establishment

FIG. 7

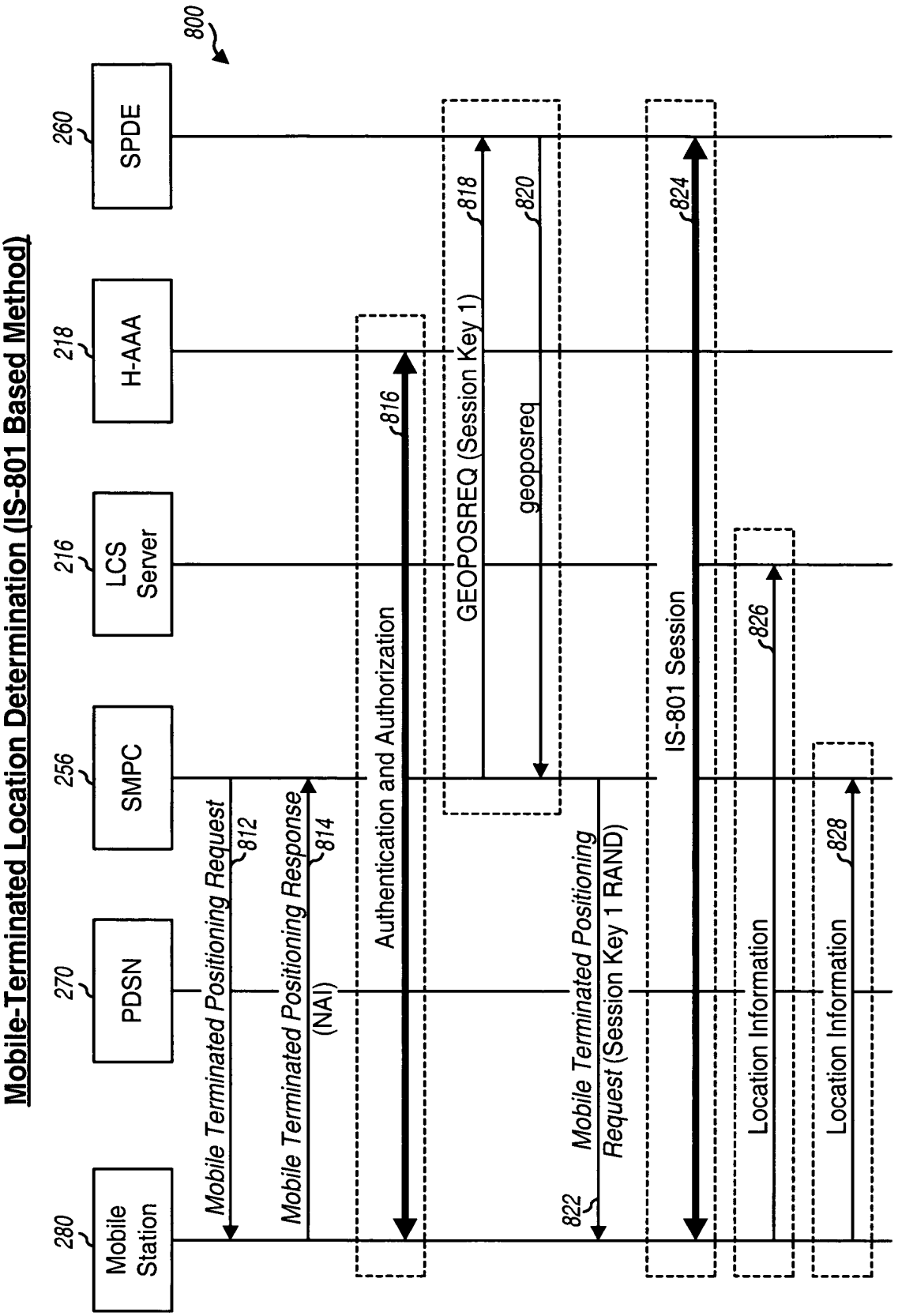
Mobile-Terminated Location Determination (IS-801 Based Method)
800
280
Mobile Station
270
PDSN
256
SMPC
216
LCS Server
218
H-AAA
260
SPDE
Mobile Terminated Positioning Request
812
Mobile Terminated Positioning Response (NAI)
814
Authentication and Authorization
816
GEOPOSREQ (Session Key 1)
818
geoposreq
820
IS-801 Session
824
Location Information
826
Location Information
828
822
Mobile Terminated Positioning Request (Session Key 1 RAND)

FIG. 8A

Mobile-Terminated Location Determination (Cell ID Based Method)

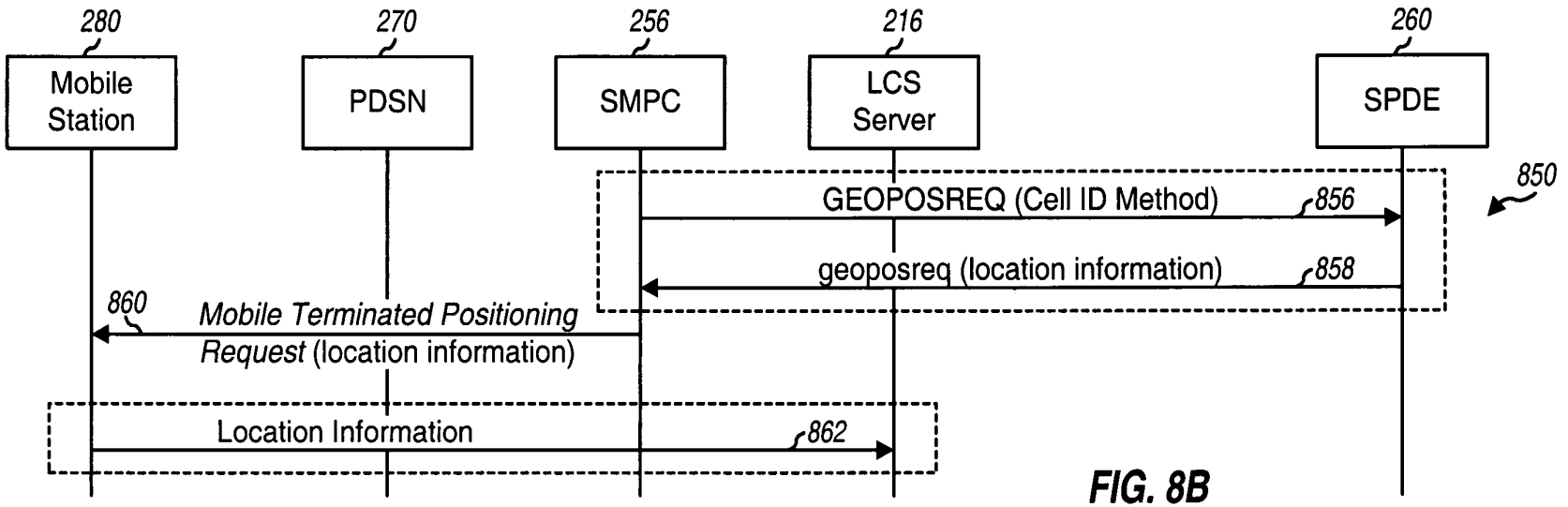

FIG. 8B

Mobile-Terminated Location Disclosure -
Location Server Located in Home Network & Location Information Cached in LCS Server

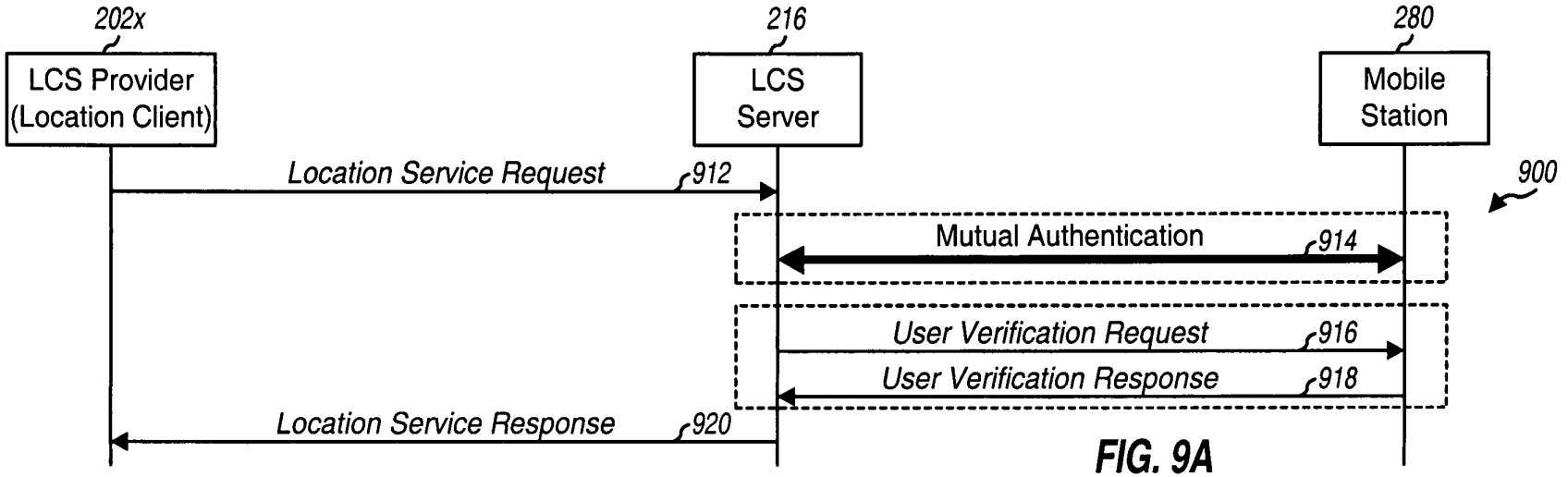

FIG. 9A

Mobile-Terminated Location Disclosure -
Location Server Located in Home Network & Location Information Cached in SMPC

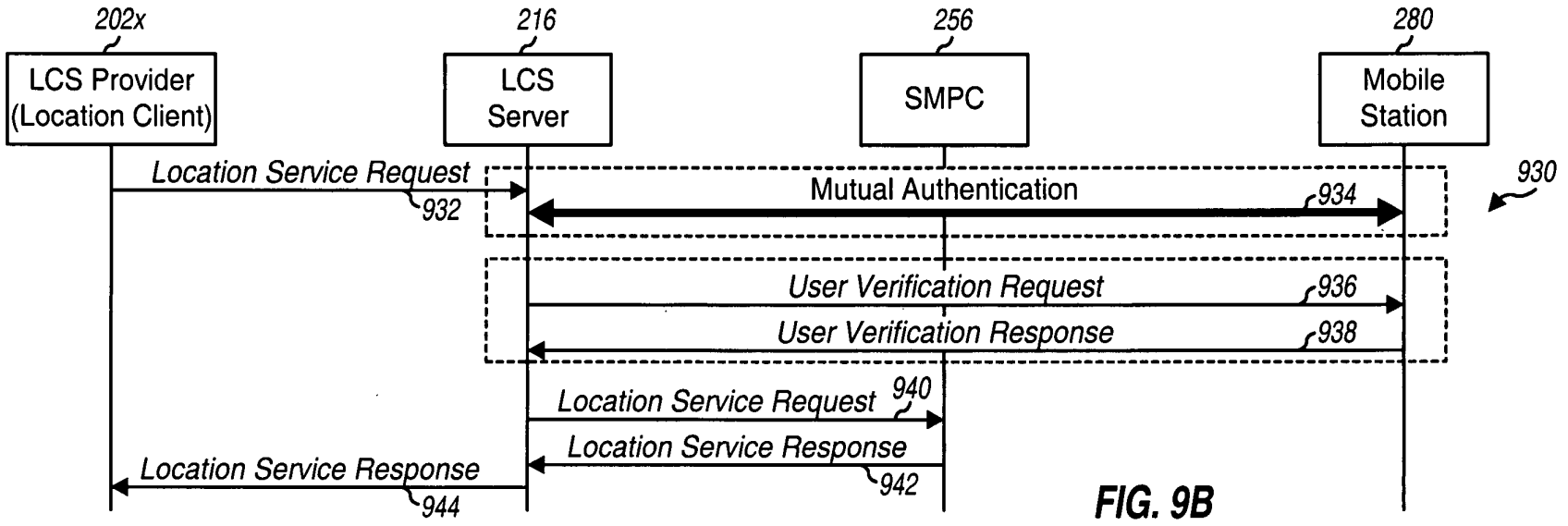

FIG. 9B

Mobile-Terminated Location Disclosure -
Location Server Located in Home Network & Location Information Cached in Mobile Station

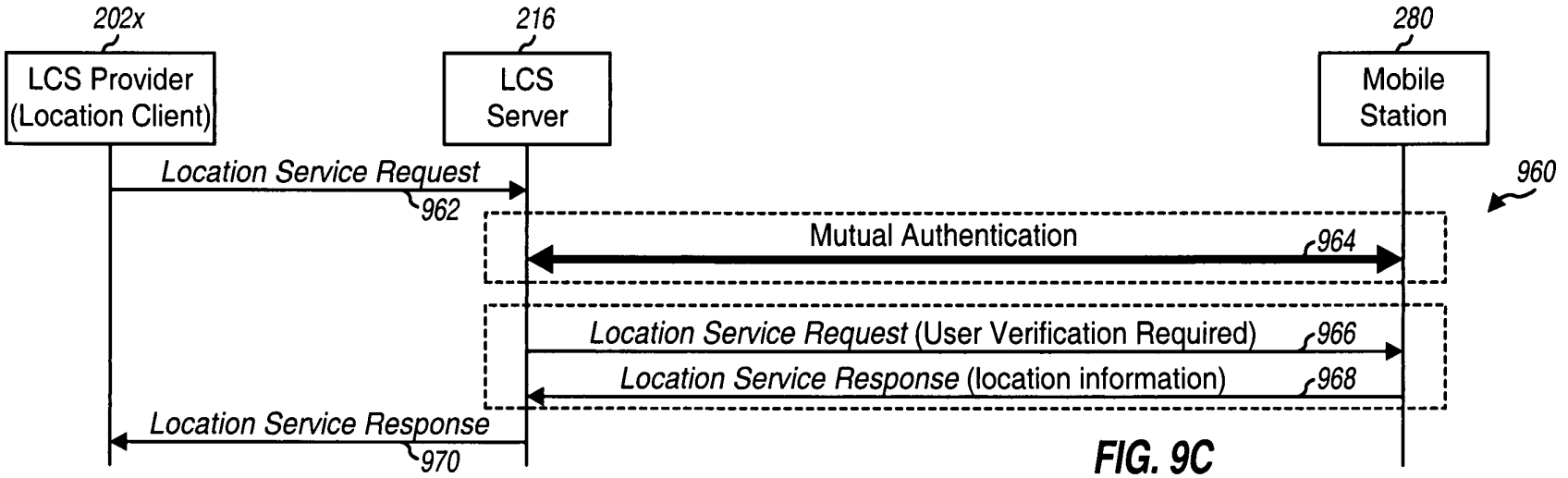

FIG. 9C

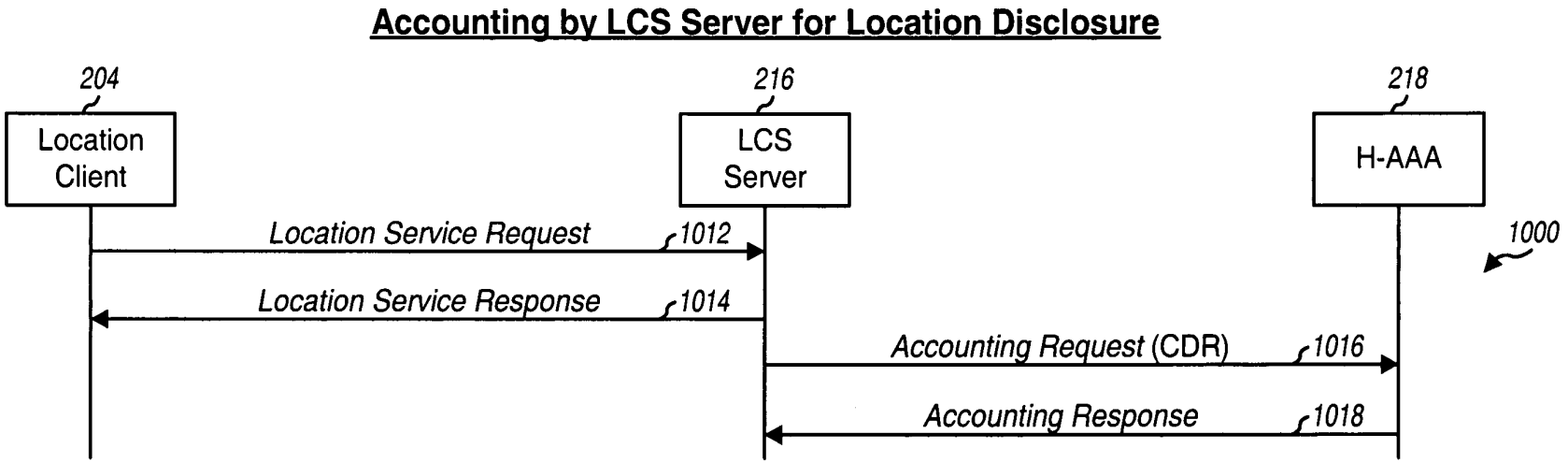

FIG. 10A

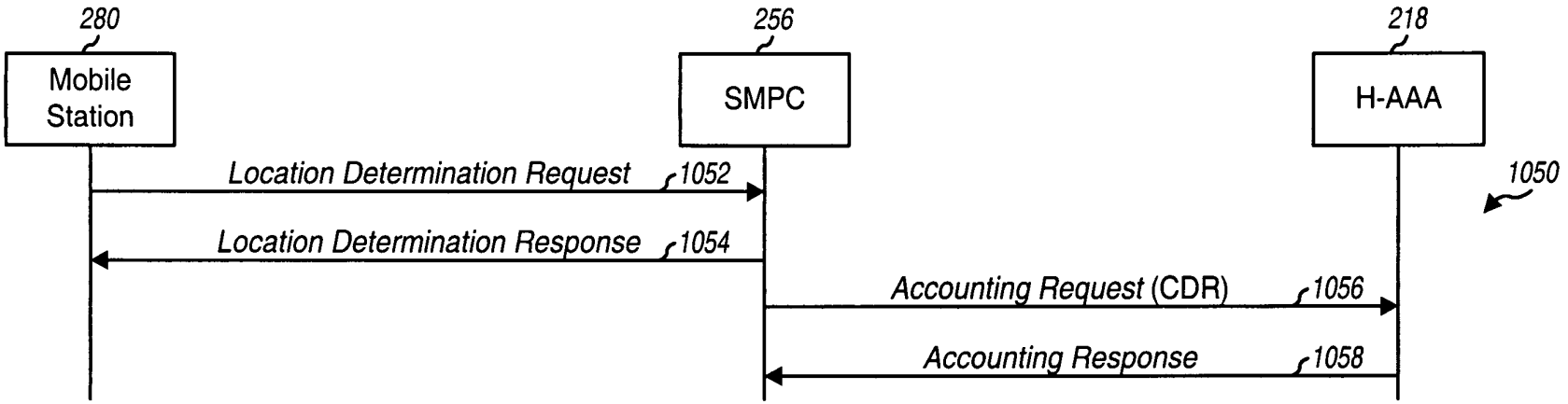

FIG. 10B

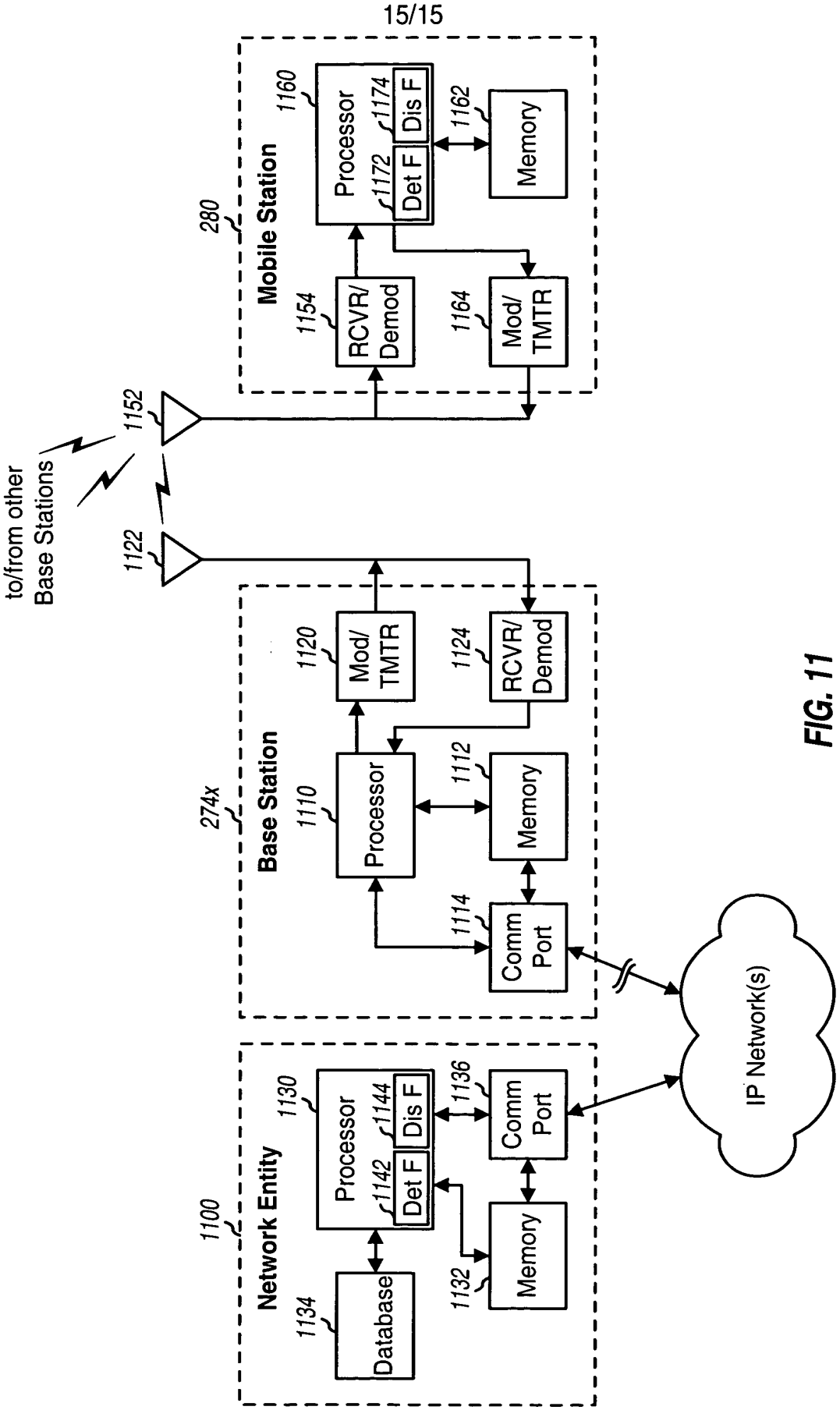
to/from other Base Stations
1152
1122
Mobile Station
280
Processor
1160
1174
Dis F
1172
Det F
1162
Memory
RCVR/ Demod
1154
Mod/ TMTR
1164
Base Station
274x
Mod/ TMTR
1120
RCVR/ Demod
1124
Processor
1110
1112
Memory
Comm Port
1114
Network Entity
1100
Processor
1130
1144
Dis F
1142
Det F
1136
Comm Port
Memory
1132
Database
1134
IP Network(s)

FIG. 11